

REMARKS

Claims 1, 17, 18, and 21 are amended. No claims are canceled. No claims are added. As a result, claims 1-5 and 17-30 remain pending in this application. Applicant respectfully submits that the amendments to the claims are fully supported by the specification, as originally filed, and no new matter has been added.

Interview Summary

Applicant thanks Examiner Tho Duong for the courtesy of a telephone interview on February 14, 2007, with Applicant's representative Michael P. Horvath, in which independent claim 24 was discussed. With respect to the § 112, first paragraph, rejection of claims 24-27 and 30 presented in the Final Office Action, Applicant believes that agreement was reached that the subject matter of claim 24 is adequately supported in the specification at least at page 5, lines 14-19, and page 8, lines 13-26. The Examiner noted that the subject matter of claim 24 is not shown in the drawings. An amendment to Fig. 2 was discussed, specifically the addition of a dividing line through the heat sink to separate the heat sink into two symmetrical structures substantially identical to each other, as described in at least the above-cited portions of the specification. The Examiner requested that the amendment to Fig. 2 be submitted for further consideration.

In the Drawings

As stated above, Applicant has amended Fig. 2 to include a dividing line that separates the heat sink into two symmetrical structures substantially identical to each other. Fig. 2 has been further amended to include reference numbers, specifically reference number "101" has been added to denote the dividing line and reference numbers "100A" and "100B" have been added to denote the symmetrical halves of the heat sink. Applicant respectfully submits that the amendments to Fig. 2 are fully supported in the as-filed specification, at least at page 5, lines 14-19 and at page 8, lines 13-26. Accordingly, no new matter has been added.

In the Specification

As stated above, Applicant has amended the specification to insert reference numbers. Specifically, Applicant has amended the paragraph on page 5 starting at line 14 and ending at line 19 and the paragraph on page 8 starting at line 13 and ending at line 26 to include reference numbers “100A” and “100B” for each reference to the symmetrical structures or halves of the heat sink and the reference number “101” for the reference to the dividing line. Applicant respectfully submits that no new matter has been added.

§112 Rejection of the Claims

Claims 24-27 and 30 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Applicant respectfully traverses this rejection.

Applicant submits that the subject matter of claims 24-27 and 30 is supported by the disclosure. Although the Office Action at page 3 contends that “[t]he claimed subject matter of ‘each of the pair of symmetrical structure [sic] substantially identical to the other’ is not supported by the disclosure”, Applicant respectfully submits that the subject matter claimed in claims 24-27 and 30 is described and/or shown in the as-filed specification. For instance, the subject matter is described in the specification at page 5, lines 14-19 and page 8, lines 13-26, and is shown in Fig. 2, as amended herein. For at least this reason, Applicant submits that this rejection be reconsidered and withdrawn. Because this is the only rejection of claims 24-27 and 30, Applicant respectfully submits that claims 24-27 and 30 are in condition for allowance.

§102 Rejection of the Claims

Claims 1, 2, 4, 5, and 17-20 were rejected under 35 U.S.C. § 102(b) as being anticipated by Elwell (U.S. Patent No. 5,315,154). Applicant respectfully traverses this rejection in view of the foregoing amendment.

Applicant has amended claims 1 and 17 to overcome this rejection. Support for the amendments to claims 1 and 17 can be found in the as-filed specification, for instance, at page 4, lines 14-17, and at page 5, lines 26-28. Applicant cannot find in Elwell each and every element presently recited or incorporated in claims 1, 2, 4, 5, and 17-20. For instance, with respect to claims 1 and 17, as amended, Applicant cannot find in Elwell:

- “forming a metal conductive structure having a cavity, the cavity including a cavity surface sloping upward from a low area located at a center of the cavity surface, the cavity surface being configured to enhance formation of convection currents within the cavity during operation of an integrated circuit, the metal conductive structure being formed with an external surface configured to thermally couple to a surface of the integrated circuit”, as recited in claim 1; or
- “forming a metal conductive structure having a cavity and a plurality of fins, the cavity including a cavity surface having a plurality of ramp structures formed on the cavity surface, the ramp structures being configured to enhance formation of convection currents within the cavity during operation of an integrated circuit, the metal conductive structure being formed with an external surface configured to thermally couple to a surface of the integrated circuit”, as recited in claim 17.

Applicant can find no description in Elwell related to, at least, forming a cavity having a cavity surface (claim 1) or ramp structures (claim 17) configured to enhance formation of convection currents within the cavity during operation of an integrated circuit. For at least this reason, Applicant respectfully submits that Elwell does not include each and every recitation of claims 1 and 17, and, therefore, the rejection of claims 1 and 17 is improper.

Additionally, dependent claims 2, 4, and 5 depend from independent claim 1 and dependent claims 18-20 depend from independent claim 17 and accordingly incorporate the features of claims 1 and 17, respectively. These dependent claims are accordingly believed to be patentable for at least the reasons stated herein. For brevity, Applicant defers (but reserves the right to present) further remarks, such as concerning any dependent claims, which are believed separately patentable.

For at least these reasons, Applicant believes claims 1, 2, 4, 5, and 17-20 to be patentable over Elwell. Accordingly, Applicant respectfully submits that the § 102(b) rejection of claims 1, 2, 4, 5, and 17-20 is improper and respectfully requests reconsideration and withdrawal of this rejection.

§103 Rejection of the Claims

Claims 1, 2, 4, and 5 were rejected under 35 U.S.C. § 102(b) as being anticipated by or in the alternative, under 35 U.S.C. 103(a) as obvious over Sotani et al. (Japanese Unexamined Patent Application Publication No. S58-110994). Applicant respectfully traverses this rejection in view of the foregoing amendment.

Applicant cannot find in Sotani et al. each and every element presently recited or incorporated in claims 1, 2, 4, and 5. For instance, with respect to claim 1, Applicant cannot find in Sotani et al. forming a metal conductive structure having a cavity, the cavity including a cavity surface sloping upward from a low area located at a center of the cavity surface, the cavity surface being configured to enhance formation of convection currents within the cavity during operation of an integrated circuit, the metal conductive structure being formed with an external surface configured to thermally couple to a surface of the integrated circuit. For at least this reason, Applicant respectfully submits that Sotani et al. does not include each and every recitation of claim 1, and, therefore, the rejection of claim 1 is improper.

Additionally, dependent claims 2, 4, and 5 depend from independent claim 1 and accordingly incorporate the features of claim 1. These dependent claims are accordingly believed to be patentable for at least the reasons stated herein. For brevity, Applicant defers (but reserves the right to present) further remarks, such as concerning any dependent claims, which are believed separately patentable.

Moreover, in the alternative, Applicant respectfully traverses this single reference rejection under 35 U.S.C. § 103(a) because, as stated above, not all of the elements recited in the claims are found in Sotani et al. Because all elements recited in the claims are not found in the reference, Applicant assumes that the Examiner is taking Official Notice of the missing elements. Applicant respectfully timely objects to the taking of Official Notice with a single reference obviousness rejection. Pursuant to M.P.E.P. § 2144.03, Applicant respectfully traverses the assertion of Official Notice and requests that the Examiner cite one or more references in support of the positions taken with respect to each of claims 1, 2, 4, and 5.

Therefore, for at least the reasons stated above, Applicant respectfully submits that claims 1, 2, 4, and 5 are allowable and request reconsideration and withdrawal of the rejection of claims 1, 2, 4, and 5.

Claims 3, 21, and 23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Elwell in view of Salyer (U.S. Patent No. 5,370,814). Applicant respectfully traverses this rejection in view of the foregoing amendment.

For reasons analogous to those stated above, Applicant cannot find in Elwell each and every recitation of claims 3, 21, and 23. For instance, with respect to claim 21, as amended, Applicant cannot find in Elwell forming a metal conductive structure having a cavity, the cavity being configured to enhance formation of convection currents within the cavity during operation of an integrated circuit, the metal conductive structure having a substantially flat external surface configured to thermally couple to a surface of the integrated circuit. Support for the amendment to claim 21 can be found in the specification, at least at page 4, lines 14-17, and at page 5, lines 26-28. Even assuming, for the sake of argument, that Elwell and Salyer are properly combinable, Salyer does not remedy at least the apparent deficiencies of Elwell described above. For at least these reasons, Applicant respectfully submits that Elwell and Salyer do not include each and every recitation of claim 21, and, therefore, the rejection of claim 21 is improper.

Additionally, dependent claim 3 depends from independent claim 1 and dependent claim 23 depends from independent claim 21 and accordingly incorporate the features of claims 1 and 21, respectively. These dependent claims are accordingly believed to be patentable for at least the reasons stated herein. For brevity, Applicant defers (but reserves the right to present) further remarks, such as concerning any dependent claims, which are believed separately patentable.

Therefore, for at least the reasons stated above, Applicant respectfully submits that claims 3, 21, and 23 are allowable and request reconsideration and withdrawal of the rejection of claims 3, 21, and 23.

Claim 29 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Elwell in view of Hanrahan (U.S. Patent No. 5,945,217). Claim 22 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Elwell and Salyer and further in view of Hanrahan. Applicant respectfully traverses these rejections in view of the foregoing amendment.

Claim 29 depends from claim 17, and claim 22 depends from claim 21. As stated above, Applicant believes claims 17 and 21 are allowable over Elwell. Even assuming, for the sake of argument, that Elwell, Hanrahan, and Salyer are properly combinable, Hanrahan and Salyer do not remedy at least the apparent deficiencies of Elwell described above. For brevity, Applicant defers (but reserves the right to present) further remarks, such as concerning any dependent claims, which are believed separately patentable.

Therefore, based upon at least their dependence from one of claims 17 and 21, respectively, Applicant respectfully submits that claims 29 and 22 are allowable and request reconsideration and withdrawal of the rejection of claims 29 and 22.

Allowable Subject Matter

Claim 28 was objected to as being dependent upon a rejected base claim, but was indicated to be allowable if rewritten in independent form including all of the recitations of the base claim and any intervening claims. Claim 28 depends from independent claim 1. For at least the reasons stated above, Applicant believes claim 1 is in condition for allowance. Therefore, Applicant respectfully submits that claim 28 is similarly in condition for allowance, based at least upon its dependence from claim 1. However, Applicant reserves the right to rewrite claim 28 in independent form during later examination of the present application or any subsequent patent applications claiming priority thereof.

Reservation of Rights

In the interest of clarity and brevity, Applicant may not have addressed every assertion made in the Office Action. Applicant's silence regarding any such assertion does not constitute any admission or acquiescence. Applicant reserves all rights not exercised in connection with this response, such as the right to challenge or rebut any tacit or explicit characterization of any reference or of any of the present claims, the right to challenge or rebut any asserted factual or legal basis of any of the rejections, the right to swear behind any cited reference such as provided under 37 C.F.R. § 1.131 or otherwise, or the right to assert co-ownership of any cited reference. Applicant does not admit that any of the cited references or any other references of record are relevant to the present claims, or that they constitute prior art. To the extent that any rejection or assertion is based upon the Examiner's personal knowledge, rather than any objective evidence of record as manifested by a cited prior art reference, Applicant timely objects to such reliance on Official Notice, and reserves all rights to request that the Examiner provide a reference or affidavit in support of such assertion, as required by MPEP § 2144.03. Applicant reserves all rights to pursue any canceled claims in a subsequent patent application claiming the benefit of

priority of the present patent application, and to request rejoinder of any withdrawn claim, as required by MPEP § 821.04.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at 612-359-3275 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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Date February 22, 2007

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 22nd day of February 2007.

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